

MADROÑO

A WEST AMERICAN JOURNAL OF
BOTANY

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MESEMBRYANTHEMUM IN CALIFORNIA

REID MORAN

Three species of *Mesembryanthemum* are well enough established in western North America to have been regarded by some authors as native. As segregated in recent studies, these are *Carpobrotus chilensis* (Molina) N. E. Br., *Cryophytum crystallinum* (L.) N. E. Br., and *Cryophytum nodiflorum* (L.) L. Bolus.

Of the thousand-odd species of *Mesembryanthemum*, a very great majority are African. Most species of *Cryophytum* are African, and the two occurring in California are found also in Africa. Likewise, most species of *Carpobrotus* are African, though the one occurring in California is found also in Chile but not in Africa. These facts seem to indicate that the California species of *Mesembryanthemum* are of African ancestry. The question is how and when they reached our shores. Was it before or after the arrival of the white man? And how long ago must they have arrived in order to be "indigenous"?

Brewer and Watson (1876, p. 251) and Wilson (1932, pp. 276-277) considered the California species of *Mesembryanthemum* as introduced. On the other hand, Parish (1890) argued that the three well-established species were indigenous; and Jepson (1914, p. 462) and Abrams (1944, p. 118) accepted this point of view. Von Poellnitz (1933, pp. 29, 36) and Munz (1935, p. 154) considered only *Carpobrotus chilensis* to be indigenous.

Parish argued that the more or less concentric distribution of these three species was "a natural arrangement for the species of an indigenous genus" but was difficult to understand on the basis of chance introduction. This argument assumes that the three species had a common ancestor in California, which is scarcely credible. The three California plants seem conspecific with plants of other lands. But even if they are not, their closest respective relationships surely are with three foreign species belonging to two very distinct groups here regarded as genera. Therefore, there must have been three—or, at the very least, two—separate introductions from other parts of the world. Any resemblance of the present distribution of *Mesembryanthemum* in western North America to the distribution of an indigenous genus must, therefore, be regarded as coincidental.

Parish noted the widespread occurrence of the *Mesembryanthemum* species in wild and isolated areas of California and Baja California, Mexico; he discussed the difficulties of explaining their early introduction, and he remarked on their apparent lack of rapid means of dissemination. He concluded that it would be difficult to account for their present wide distribution if they had been introduced since the Spanish settlement.

Although the means of dissemination may be difficult to understand, they seem none the less effective: there is some evidence that both *Cryophytum crystallinum* and *C. nodiflorum* have spread considerably since Parish's time.

Parish knew *Cryophytum nodiflorum* only from Santa Catalina and San Clemente islands and from the mainland in the immediate vicinity of San Diego, though it had also been collected on San Nicolas Island and at Santa Monica. From the early lists for the other islands of southern California and Baja California, *C. nodiflorum* was absent. It was first reported for Santa Rosa and San Miguel islands in 1932 and for Santa Barbara Island in 1941; and it has been found this year on Santa Cruz Island (*Moran 3331*). It was first collected on Guadalupe Island in 1932 and San Benito Island in 1937, and my collection in 1948 (*Moran 3030*) seems to be the first from Cedros Island. On the mainland it is now known from Santa Barbara County, California, to Socorro and San Bartolomé Bay, Baja California. It has also been collected at the mouth of the Pistol River, Oregon, and on ballast at Linnton, Oregon; but Professor M. E. Peck writes that he has no good evidence of its recent occurrence in Oregon.

Cryophytum crystallinum was widely distributed in California and Baja California at the time of Parish's writing. There is a suggestion, however, that it also has since spread both to the north and to the south. Then known only as far north as Santa Barbara County, it now occurs in the vicinity of Carmel. On his trip north from Magdalena Bay, Baja California, in 1889, T. S. Brandegee first encountered this species at San Benito, about 130 miles to the north. It has now been collected as far south as Rancho Salada, near Magdalena Bay; and reports not authenticated by specimens indicate that it may occur considerably farther south. More convincing evidence for the southward extension of *C. crystallinum* would be its discovery at some southern locality where Brandegee collected extensively but failed to find this conspicuous and weedy plant.

The apparent expansion of range of these two species of *Cryophytum* in the last sixty years might be explained partly as an increase in our knowledge of the range. On this basis, however, it is difficult to understand the apparent extension in both directions from an original center; for botanical exploration did not progress in a similar pattern. Thus it appears that *Cryophytum nodiflorum* has spread markedly in recent years, and it seems possible that this plant could have achieved its present distribution from one introduction since the Spanish settlement. With *C. crystallinum*, the evidence, though less convincing, points in the same direction.

Carpobrotus chilensis occurs along the coast from Oregon to Baja California and on the coast of Chile. This distribution pattern is similar to those of several plants whose nativity in

western North America is not questioned. There is no evidence at hand of recent extension of range. At present, therefore, there seems no reason to doubt that this species is native in western North America.

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THE GENUS BURRAGEA OF LOWER CALIFORNIA, MEXICO

JOHN H. THOMAS

The first collection of a member of the genus *Burragea*, in the family Onagraceae, made in 1844 by R. B. Hinds, surgeon on H. M. S. "Sulphur," at Magdalena Bay, Lower California, Mexico, was described by George Bentham (1844, p. 15) as *Gaura? fruticulosa*. Bentham considered the development of the seeds within the branch to be due to fungi or to an unknown disease. The question mark between the genus and species name indicates that Bentham was doubtful as to the correct generic status. Mary Curran (1888, p. 231) described a new species, *Gongylocarpus frutescens*, from a collection made by W. E. Bryant, apparently without knowledge of *Gaura fruticulosa*. The following year, T. S. Brandegee (1889, p. 158) collected *Gaura fruticulosa*, which he transferred to *Gongylocarpus* Cham. & Schl., a related genus of the Mexican mainland, and gave *Gaura fruticulosa* and *Gongylocarpus frutescens* as synonyms. In the spring of 1911, while a member of the "Albatross Expedition," J. N. Rose collected specimens of what he and J. D. Smith determined as *Gongylocarpus frutescens* and *Gongylocarpus fruticosus*. However, they considered these two species to be sufficiently distinct from the mainland species of *Gongylocarpus* to merit segregation as a new genus, *Burragea* (1913), named in honor of Commander G. H. Burrage who was in command of the "U. S. S. Albatross" on the expedition to Lower California in 1911. The two species of *Burragea* that Rose and Smith recognized were *B. fruticulosa* and *B. frutescens*. However, as Brandegee (1889) had pointed out, *B. fruticulosa* and *B. frutescens* are synonyms. The specimens that Rose and Smith

called *B. frutescens* are distinct from those of *B. fruticulosa*. Since the name *B. frutescens* belongs in the synonymy under *B. fruticulosa*, a new name must be given to the entity that Rose and Smith called *B. frutescens* (1913, p. 298). The following treatment represents the writer's concept of the limits of and entities constituting the genus *Burragea*.

BURRAGEA Donn. Smith & Rose, Contr. U. S. Nat. Herb. 16: 297. 1913.

Plants low, freely branching shrubs, 3–6 dm. tall. Leaves alternate, subsessile, entire, somewhat thickened. Flowers in dense leafy terminal spikes, solitary in the leaf-axils. Calyx-tube filiform, attached to the stem. Calyx-lobes 4, lanceolate, tapering into an acute tip, reflexed in anthesis. Petals 4, orbicular to obovate. Stamens 8, all functional; anthers versatile. Stigma capitate to shallowly bilobed. Ovary 2-celled, enclosed in woody stem, at length dehiscent. Seeds one in each cell.

Type species: *Gaura* ? *fruticulosa* Benth.

Burragea occurs in a restricted region about Magdalena Bay, Lower California, Mexico.

KEY TO THE SPECIES

- | | |
|---|----------------------------|
| Plants glabrous, leaves oblanceolate | 1. <i>B. glabra</i> . |
| Plants glandular-pubescent, leaves linear to narrowly
oblanceolate | 2. <i>B. fruticulosa</i> . |

1. *Burragea glabra* sp. nov. Planta fruticosa glabra, 3–6 dm. alta, ramis numerosis, brevibus, foliis oblanceolatis, alternis, glabris, subsessilibus, 2–3.5 cm. longis, 5–8 mm. latis, tubo calycis 2–2.5 cm. longo, ca. 1 mm. lato, lobis calycis (sepalis) 4, lanceolatis, basi obtusis, ca. 1 cm. longis, petalis 4, orbicularibus vel obovatis, ca. 1 cm. longis, staminibus 8, ad summam calycis tubi insertis, stylo filiformi, stigmatibus capitato, ovario biloculari in ramum floriferum immerso.

Plants low spreading shrubs, 3–6 dm. tall, freely branched, branches often appearing short and stunted, young ones purplish, aging reddish-brown, bark shredding, glabrous; leaves numerous at ends of twigs, oblanceolate, 2–3.5 cm. long, 5–8 mm. wide, subsessile, glabrous, sometimes adhering to fruiting branch for some time; flowers 4-merous, showy, single in leaf axils; calyx-tube narrow, 2–2.5 cm. long, about 1 mm. wide, glabrous, partly closed at summit and prolonged into a collar beyond the point of attachment of petals, calyx-lobes, and stamens; calyx-lobes lanceolate, somewhat obtuse at base, about 1 cm. long, glabrous, reflexed in anthesis, rose colored, tips acute, free in the bud; petals orbicular to obovate, about 1 cm. long, slightly clawed, rose-colored, drying pink; stamens 8, all functional; filaments 5–9 mm. long; anthers versatile, about 2 mm. long, yellow; style equalling or exceeding stamens, filiform, stigma capitate, about

1 mm. broad, often shallowly bilobed; ovary enclosed in woody stem, forming a rough clavate structure, 2-8 cm. long; 4-7 mm. in diameter, glabrous, with shallow indentations along which splitting at length occurs; seeds two, one in each cell, 3-4 mm. long, angled, dark brown.

Type. Santa Maria Bay, Magdalena Island, Lower California, Mexico, March 18, 1911, *J. N. Rose 16263* (US, no. 638328; isotype, UC, no. 180094). Abbreviations of names of herbaria are according to Lanjouw (1939).

This collection (*J. N. Rose 16263*) was referred to *Burragea frutescens* by Smith and Rose. The type specimen of *Gongylocarpus frutescens* has been compared with specimens of *Burragea fruticulosa* and with a photograph of the type of *Gaura fruticulosa*, and it is identical with the latter species. *Burragea glabra* differs from *B. fruticulosa* in being completely glabrous and in having broader and more oblanceolate leaves. The leaves of *B. fruticulosa* are quite constant as to shape; the glandular-pubescence varies in length on the same plant, up to about 0.5 mm., the longer trichomes usually being found on the more terminal branchlets. Even though the material, on which the description of *B. glabra* is based, consists of only one collection, it appears to be sufficiently distinct from *B. fruticulosa* to be given specific rank.

2. BURRAGEA FRUTICULOSA (Benth.) Donn. Smith & Rose, Contr. U. S. Nat. Herb. 16: 298. 1913. *Gaura* ? *fruticulosa* Benth. Bot. Voy. Sulph. 15. 1844. *Gongylocarpus fruticulosus* T. S. Brandegee, Proc. Calif. Acad. Sci. Ser. 2, 2: 158. 1889. *G. frutescens* Curran, Proc. Calif. Acad. Sci. Ser. 2, 1: 231. 1888. *Burragea frutescens* Donn. Smith & Rose, loc. cit. 298.

Plants low shrubs, 3-6 dm. tall, branching freely, glandular pubescent, branches often short and stunted, purple in youth, reddish-brown in age; bark shredding; leaves closely set at the ends of twigs, linear-lanceolate to somewhat oblanceolate, 2-4 cm. long, 2-6 mm. wide, subsessile, gland tipped, glandular-pubescent, reduced upwards, often adhering to fruiting branch even after seed is mature; flowers 4-merous, single in the leaf axils, showy; calyx-tube narrow, 1.5-3 cm. long, about 1 mm. in diameter, glandular-pubescent, partly closed at top by an annular disk and produced into a collar beyond the point of attachment of petals, calyx-lobes, and stamens; calyx-lobes narrowly lanceolate, about 1 cm. long, externally glandular-pubescent, attenuated into a tapering acute tip, refracted in anthesis, rose-colored; petals orbicular to suborbicular to obovate, about 1 cm. long, slightly clawed, rose-colored, drying pink; stamens 8, all functional, equal or subequal, 5-9 mm. long; anthers versatile, about 2 mm. long, yellow; style equalling or exceeding stamens, filiform, stigma capitate, about 1 mm. broad, often shallowly bilobed; ovary 2-celled, enclosed in woody stem, forming a rough, clavate structure, 2-10 cm. long, 4-6 mm. in diameter, with shallow indenta-

tions between ovaries, along which splitting occurs tardily, long persistent on the plant, glandular-pubescent; seeds 2, one in each cell, 3-4 mm. long, angled, pubescent, dark brown.

Type. Magdalena Bay, Lower California, Mexico. *R. B. Hinds*, in 1841 (K, no. 1845).

Collections are known only from Magdalena Bay and Santa Margarita and Santa Magdalena islands, and have been made only along the coastal region. The fact that specimens with mature flowers have been collected from January through November, may indicate that flowering occurs whenever there is sufficient moisture.

Specimens examined. LOWER CALIFORNIA, MEXICO. Magdalena Bay: May 29, 1925, *Mason 1885* (DS, CAS, NY, US); October 10, 1939, *Berry 51* (DS, CAS); January, 1889, *Brandegee* (DS), November, 1902 (US); 1888, *Bryant* (CAS, type of *G. frutescens* Curran). Magdalena Island: January 13, 1889, *Brandegee* (UC, US), March, 1892 (NY, UC); 1888, *Bryant* (UC); April 11, 1930, *Johansen 620* (DS); March 1917, *Orcutt 45* (US), March, 1917, *88* (NY, US); November 24, 1905, *Nelson & Goldman 7295* (US). Santa Margarita Island: April 9, 1930, *Johansen 617* (CAS, DS); March 19, 1911, *Rose 16284* (UC, US), March 20, 1911, *16284b* (NY).

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STUDIES ON THE FLORA OF CHIAPAS, MEXICO—VI

EIZI MATUDA

The present paper, like the preceding ones of this series listed at the end of this paper, is devoted principally to reporting new or otherwise noteworthy species of plants from Chiapas, southernmost of the Mexican states. All of the following material has been based upon the writer's own collections.

Grateful acknowledgments are due Dr. H. N. Moldenke of the New York Botanical Garden and to Dr. Herbert L. Mason of the

University of California for their friendly suggestions and valuable aid.

MUSACEAE

Musa mexicana sp. nov. Planta valida stolonifera caespitos diam. ca. 2–2.5 m. ferens tronco diam. 10–15 cm. cauli subcylindrico. Folia longipetiolata, petioli 8–10 dm. longi subteretes diam. 3–4 cm. insuper canaliculati usque ad laminas longo-vaginati ore membranaceo fibroso ochraceo, laminae oblongo- vel elliptico-lanceolatae apice obtusae vel rotundatae basi rotundatae vel inaequilaterales, usque ad 10–15 dm. longae 26–35 cm. latae supra atro-virides subtus flavo-virides glabrae integrae nitidae (laminae juvenculatae subtus bruneo-virentes). Inflorescentia valde erecta pedunculata, pedunculus 3–4 dm. longus diam. ca. 2.5–3 cm. glaber, bractee numerosae deciduae extus roseae vel lilaceae intus pallidae subcymbiformes ovatae vel oblongo-ellipticae apice obtuso-acuminatae basi truncatae subamplexicaules 15–25 cm. longae 6–9 cm. latae chartaceae longitudinaliter nervatae, eae 6–8 vel 10 infimae flores feminas, reliquae 15–20 superiores flores masculinas subtendentes; flores utrorumque sexuum 6 vel raro 4–5 sessiles semper uniseriatim in bractee unicae axilla dispositi, eorum perigonium simplex cylindraceum aurantium latere fissum apice 5-dentatum ore reflexum basi truncatum amplexicaule striatum; petalum unicum (perigonium interius) decolor semipellucidum ovatum apice acuminatum vel acutum perigonio aequilongum basi truncatum paullo vel valde striatum. Perigonium florum masculinorum basi truncato-amplexicaule, 3.5–4.2 cm. longum; stamina 5 primo sepalis breviora sub anthesi eis paullo longiora exserta, filamentis complanatis 2.7 cm. longis, antheris connatis linearibus bilocularibus purpureis 1.8 cm. longis; ovarii rudimentum nudum trigono-obconicum stylo columnariformi albo usque ad medium trifido. Staminodia florum feminorum 5 teretes albida apice aristata 2 cm. longa; eorum stylus teres albidus 3–3.5 cm. longus primo pilosiusculus sub anthesi glabratus stigmate capitato ovario 3-loculare glabro tetragono-subcylindrico 4–4.5 cm. longo 0.7–1 cm. lato. Fructus tetragono-cylindraceus diam. 1.5 cm. 6–8 cm. longus; semina numerosa (35–55), semiturbinate depressa nigra (figs. 1–10).

Type. Brookside at about 100 m. altitude, in a wet sunny field, near Colonia Hidalgo, Acacoyagua, Chiapas, June 5, 1948, *Matuda 18320* (Matuda Herbarium; isotypes at the Instituto de Biología de la Universidad Nacional de México and at the Chicago Natural History Museum).

Additional specimens. CHIAPAS. Moist sunny thickets along brookside near Cruz de Piedra, 4 km. north of Acacoyagua, July 15, 1948, *Matuda 18321*; beside brook in wet field, altitude about 150 m., Colonia Cintalapa, 7 km. east of Escuintla, August 15, 1948, *Matuda 18319*; moist thickets along brookside, Pataste, 12



FIG. 1. Flowers of *Musa mexicana* Matuda. 1-6, staminate flower: 1, general view; 2, side view, 3, perigonium, opened; 4, petal, opened; 5, rudimentary pistil; 6, stamen. 7-10, pistillate flower: 7, side view; 8, perigonium, opened; 9, petal, opened; 10, pistil showing staminodia. All approximately natural size.

km. north of Acapetahua (a Pan-American railway station), June 20, 1949, *Matuda* 18669.

Local name: "Plátano silvestre." Occasional, being neither common nor yet rare, and mostly in the wild state. It is never found at elevations below 100 meters, being evidently restricted to a belt between 100 and 300 meters above sea level, and always close to the banks of brooks. It is quite generally distributed between these elevations in the District of Soconusco, and it is sometimes cultivated by the natives along plantation-borders for its attractive rosy bracts.

This new species seems very close to *Musa rosacea* Jacq., but it differs from this in its longer perigonia, and in having six flowers uniseriate in the axils of single bracts, very wide acuminate petals and long stout petioles.

Musa mexicana is not only noteworthy as a novelty but is, in addition, the first record of the occurrence of the genus *Musa* in the native wild flora of the American continent. All the other species so far known have originated in southeastern Asia.

ARACEAE

Anthurium giganteum sp. nov. Planta acaulis caudice radicibusque aeriis carnosis numerosis cataphyllis latis ca. 4 cm. longis mox emarcidis fibrosis, foliis magnis petiolatis coreaceis oblanceolato-oblongis 11–12 dm. longis medio 3–5 dm. latis ad apicem versus gradatim attenuatis vix acuminatis basi acutis vel cuneatis costa crassa venis lateralibus 18–20 patentissimis arcuatim in marginem excurrentibus petiolis crassis 7–15 cm. longis, vivis semitrigonis geniculis ca. 1.5 cm. longis vaginis basilibus parvis circiter 3 cm. longis, pedunculis teretibus crassis glabris 45–50 cm. longis, spatha persistente glauca vel lilacina nitida lineari-lanceolata basi rotundata apice acuta spadice fructifero lilacino cylindraceo 50–65 cm. longo, diam. 2–2.5 cm. floribus ignotis.

Type. On large tree in damp woods by river bank, altitude about 250 m., Salto de Agua, 15 km. northeast of Escuintla, Chiapas, July 15, 1948, *Matuda 18043* (Matuda Herbarium, isotypes at the Instituto de Biología de la Universidad Nacional de México and at the Chicago Natural History Museum).

The affinities of this species are with *Anthurium salviniae* Hemsl. and *A. crassinervium* Schott, but our species is readily distinguished by its large leaves and very large and long spadix.

Anthurium cuspidatum sp. nov. Planta majuscula terrestris caudiculo brevi crasso internodiis brevissimis cataphyllis latis ca. 3 cm. longis fibrosis mox decompositis, petiolis gracilibus subteretibus 20–28 cm. longis fere 1 cm. infra apicem nodoso-incrassatis, laminis coreaceis elongato-hastiformibus 20–25 cm. longis infra medium 6 cm. latis ad apicem versus gradatim attenuatis vix acuminatis vel cuspidatis lobis posticis apice subrotundatis sinibus 15–25 cm. latis ex basi 9-nervosa costa elevata

utroque latere nervis ca. 6 angulo angusto adscendentibus tenerimis subarcuatis prope marginem in nervum collectivum conjunctis, pedunculis gracilibus 30 cm. longis, spatha reflexa rufescente lanceolata apice acuminata basi truncata dilatata amplectente 5 cm. longa diam. 1 cm., spadice sessili in sicco fusco-purpureo 5.5 cm. longo gracili.

Type. In a shaded forest, altitude 700 m., near Colonia Jalapa, 32 km. east of Escuintla, Chiapas, July 3, 1948, *Matuda 18316* (Matuda Herbarium; isotypes at the Instituto de Biología de la Universidad Nacional de México and at the Chicago Natural History Museum).

Additional specimen. In mature forest, altitude 1800 m., near Colonia San Juan Panamá, about 45 km. east of Escuintla, on the Pacific slope of the Sierra Madre de Chiapas, Chiapas, July 23, 1948, *Matuda 18159*.

ANTHURIUM CHIAPASENSE Standl. Field Mus. Pub. Bot. 22: 67. 1940.

This plant, previously known only from the type collection, was recently collected by the writer in a mature mixed rain forest on the Pacific slope of the Sierra Madre de Chiapas at an elevation of 1800 m. near Colonia San Juan Panamá, about 50 km. east of Escuintla, Chiapas, July 23, 1948 (*Matuda 18315*).

Philodendron monticola sp. nov. Planta epiphytica scandens caudiculo crasso internodiis superioribus radicibus aeriis haud exceptis 7 cm. longis, petiolis teretibus crassis ca. 4 dm. longis vaginis 6 cm. longis laminis coreaceis oblongis cordiformibus ca. 35 cm. longis basi 26 cm. latis apice sensim acuminatis basi late profundeque cordatis lobis posticis obtuse rotundatis auricularum venis 5 arcuatim excurrentibus reliquis utrinque 6 vel 7 prominentibus, pedunculo crasso terete 7 cm. longo, spatha 10–12 cm. longa infra medium valde constricta basi subglobosa clausa extus viridi intus ochroleuca infra basim purpurea, spadice vix exserto albido-flavescente cylindrico-subsessili 8 cm. longo longitudinis quartam partem pistillato reliquam partem sine staminodiis staminato.

Type. On a large tree in mature forest on the Pacific mid-slope of the Sierra Madre, altitude 1600 m., near Colonia San Juan Panamá, 50 km. east of Escuintla, July 22, 1948, *Matuda 18169* (Matuda Herbarium; isotypes at the Instituto de Biología de la Universidad Nacional de México and at the Chicago Natural History Museum).

Philodendron monticola may be distinguished from *P. oxycardium*, its closest relative, because of its thick leaf and rather small spathe. Also, it occurs at a much higher altitude, *P. oxycardium* occurring in southern Mexico between the altitudinal limits of 100 and 500 meters.

Philodendron apocarpum sp. nov. Planta epiphytica scandens ramulorum internodiis superioribus diam. 1.5-2 cm. ca. 12 cm. longis petiolis ca. 20 cm. longis gracilibus usque ad $2/3$ longitudinis vaginatis laminis coreaceis oblongo-cordatis integris apice acutis vel acuminatis basi lata breviter lateque cordatis 12-15 cm. longis 12 cm. latis nervis primariis ca. 8 subtus prominentibus, pedunculo crasso tereti spatham subaequilongo, spatha semipersistente decidua ca. 15 cm. longa infra medium valde constricta basi sanguinea subglobosa clausa extus caeruleo-viridi intus ad apicem versus flavo-virente, spadice sessili vix exserto lacteo cylindrico 12 cm. longo eius quintam partem basalem flores pistillatos quintam partem intermediam staminodia et tres quintas partes reliquas ad apicem versus flores staminatos ferente, fructo rubente.

Type. In woods along Río Cintalapa, at Gilguero, 15 km. east of Escuintla, Chiapas, altitude about 200 m., August 10, 1948, *Matuda 18313* (Matuda Herbarium, isotypes at the Instituto de Biología de la Universidad Nacional de México and at the Chicago Natural History Museum).

Additional specimens. CHIAPAS. In extensive open woods along Río Cintalapa, near Aguas Calientes, 3 km. northwest of Escuintla, altitude 70 m., *Matuda 18312*; in open woods along brooks, Salto de Agua, Escuintla, altitude 250 m., September 8, 1947, *Matuda 17789*; in open woods, epiphytic on a large tree, Esperanza, 15 km. northeast of Escuintla, altitude 200 m., August 12, 1948, *Matuda 18314*.

Philodendron apocarpum has much the general aspect of *P. oxycardium* which occurs in the same region and with which it has been confused. Our species is readily distinguished by its thinner leaves and longer petiole-sheaths, but a more essential difference is to be noted in the form of the female flowers, conspicuous for their masses of elongated ovaries. The spathe is semi-persistent, not deciduous until after the fruit has ripened.

ANNONACEAE

ANNONA SPRAGUEI Safford, Contr. U. S. Nat. Herb. 16: 270. 1913.

This species has been treated as a restricted endemic of Panama in Standley's Flora of the Panama Canal Zone (Contr. U. S. Nat. Herb. 27: 180. 1928), and as far as I am aware, there have been no reports of its occurrence elsewhere. Yet *Annona Spraguei* occurs on the Pacific slope of the Mexican State of Chiapas (in sandy sunny woods drained by Río Cacaluta, Colonia Hidalgo, 16 km. north of Acacoyagua, altitude about 100 m., September 3, 1947, *Matuda 16888*). Its local name is "Chincuya de llano." This specimen was once identified by J. Steyermark as *A. purpurea* Moc. & Sesse and so distributed.

ANNONA SCLERODERMA Safford, Jour. Wash. Acad. Sci. 3: 105, fig. 1. 1913. Contr. U. S. Nat. Herb. 18: 18, figs. 22–23. 1914; Standley & Steyermark, Flora of Guatemala, Fieldiana, Bot. 24 (4): 279–280. 1946.

This plant was described from Guatemala and is known as well from British Honduras and the Atlantic coast of Honduras, but apparently, there has been no previous indisputable record of its occurrence in Mexico. In his description of *A. scleroderma*, Safford (op. cit., p. 106) stated, "seeds sent . . . to the U. S. Department of Agriculture from the state of Oaxaca belong very probably to this species." It has been found to grow in the Pacific coastal lowland forest in Chiapas and is known only in the wild state (Finca Esperanza, in a mixed wet forest, 8 km. northeast of Escuintla, altitude 160 m., September 15, 1948 *Matuda 18405*). Its local name is "chirimoya de monte." The edible fruits ripen in January and February. In this region, this tree grows 15 to 20 meters tall with a trunk diameter of 2.5–3 decimeters and with a rather well developed crown.

MELIACEAE

CEDRELA SALVADORENSIS Standl., Field Mus. Publ. Bot. 4: 215. 1929.

This plant had been reported earlier from Salvador and more recently from Guatemala (Standley & Steyermark, Flora of Guatemala, Fieldiana, Bot. 24 (5): 450. 1946). Now it is known to occur in Chiapas, southern Mexico (wet mixed forest, altitude about 700 m., Finca la Brisa, 25 km. east of Escuintla, August 10, 1948, *Matuda 18368*). This species is therefore new to the Mexican flora and its occurrence in Chiapas probably represents the northern limit of its range.

APOCYNACEAE

Aspidosperma chiapense sp. nov. Arbor magna recta 25–30 m. alta tronco diam. 8–12 dm. ligno roseo ramulis juvenibus viridibus glabris tandem rugosis vel verrucosis griseis internodiis ca. 1 cm. longis, foliis alternatis proximis rigide coreaceis oblongo-lanceolatis ad apicem versus gradatim attenuatis utrinque vix acuminatis glabris supra lucidis subtus opacis in sicco fusco-olivaceis 15–18 cm. longis medio 4–5 cm. latis costis utrinque elevatis nervis lateralibus utrinque paulo elevatis numerosissimis approximatis parallelis in marginem revolutem desinentibus petiolis 2–3 cm. longis. Inflorescentia apice praecipue densa cymoso-paniculata vel umbelliformis paniculis terminalibus 5–7 cm. longis latisque pedunculis ramisque subglabris vel leviter hirsutis; calyx coreaceus extus minute stellatus intus glaber 3 mm. longus lobis 5 elongato-triangularibus semi-imbricatis 2 mm. longis; corolla pallide testacea salviformis vel tubiformis 7 mm. longa 5-lobata lobis filiformibus 2 mm. longis; stamina 5 prope

medium corollae oriunda filamentis liberis 1 mm. longis glabris antheris bilocularibus 1 mm. longis semi-clavatis apice acuminatis; stylus columniformis (stigmatе incluso) 7 mm. longus; ovarium semi-globosum apocarpum 1 mm. longum 0.8 mm. latum folliculis obovoideo-oblongis apice rotundatis mucronulatisque basi sensim attenuatis vel cuspidatis 16 cm. longis 10 cm. latis extus rugoso-nervosis minute sericeo-velutinis seminibus numerosis (30-40) semi-orbicularibus diam. ca. 8 cm. embryo submedio cotyledonibus oblongo-orbicularibus basi plus minusve cordatis 2 cm. longis. Latex in petiolis ramulisque juvenilibus albus, in folliculo pallide roseus.

Type. In wet forest, Esperanza, Escuintla, altitude about 160 m., Chiapas, Mexico, February 15, 1946, *Matuda 16361* (flowers) (Matuda Herbarium, isotypes at the Instituto de Biología de la Universidad Nacional de México and at the Chicago Natural History Museum).

Additional specimens. CHIAPAS. In the region about Esperanza, Escuintla, altitude about 160 m., August 15, 1948 (perfect leaves and immature fruit), *Matuda 18412*; in wet mixed forest, Cacaluta, Acacoyagua, altitude 170 m., February 1, 1946 *Matuda 18406* (flower and fruit).

Local names: "Chichi colorado"; "Chichi prieto."

This plant has long been confused with *A. cruentum* Woodson, who himself identified my specimen (16361), sent to him by the United States National Herbarium, as that species. *Aspidosperma chiapense*, however, is very different, and may be distinguished by its longer leaves, long petioles, larger follicles and rather large flowers.

This tree-species is well known and esteemed by native lumbermen for its timber, the sapwood being white or yellowish-white and the heartwood dull rose and so hard when cured that it is impossible to drive a nail into it. The bark is grayish-brown, about 4 cm. thick, scaly or with coarse deep fissures, and secretes no latex.

The original description of *A. cruentum* was based on a flowerless specimen. We therefore have had no opportunity thus far of comparing its diagnostic floral structures with those of our species.

ASPIDOSPERMA CHIAPENSE f. *tenax* f. nov. Folia semper pendula; lignum semper luteum vel luridum valde tenax.

Local name: "Chichi amarillo."

The wood of f. *tenax* is not a favorite of the native lumbermen because of its toughness. It occurs mixed with *A. chiapense* in the same forest.

Type. In wet forest, Esperanza, Escuintla, Chiapas, January 25, 1948, *Matuda 17386* (Matuda Herbarium; isotypes at the Instituto de Biología de la Universidad Nacional de México and at the Chicago Natural History Museum).

Additional specimen. In the region of Esperanza, Escuintla, Chiapas, August 15, 1948, *Matuda 18413* (perfect leaf and immature fruit).

From herbarium material alone, it is not easy to separate *A. chiapense* from its forma *tenax*, though it is easily distinguished in the forest by its generally somewhat smaller and pendent leaves of which the natives have been heard to say, "Se ve hojas tristes." A more essential character, however, is the tough yellowish heartwood. Its bark is the same color as that of *A. chiapense*, but it is rather thin and not deeply fissured. The latex which, as in the case of typical *A. chiapense*, is secreted only from young branches and petioles is always white and never pinkish.

Cufodontia escuintlensis sp. nov. Arbor magna erecta 25 m. alta diam. 5–7 dm. ramulis teretibus griseis glabris lenticellis multis parvis internodiis 1–2 cm. longis foliis alternatis coreaceis vel pergameniis oblongo-lanceolatis 15–20 cm. longis 4–5 cm. latis ad apicem versus gradatim attenuatis utrinque vix obtusis margine integris in sicco flavo-olivaceis glabris supra paulo nitidis subtus opacis costis supra impressis subtus elevatis venis primariis lateralibus utroque costae latere parallelibus approximatis 27–30 gracillimis supra haud subtus tenuiter elevatis petiolo glabro supra caniculata 1–1.5 cm. longo. Inflorescentia cymae extra-axillariae alternatae floribus 25–30 constantes pedunculo minute puberulo pedicellis 3–5 mm. longis minute puberulis calycibus exterioribus coriaceis campanulatis extus puberulis intus glabris 4 mm. longis basi 1.7 mm. latis 2-lobatis apice obtuso-rotundatis concavis interioribus paulo minoribus ad 3 mm. longis 1.4 mm. latis corollis flavo-albis eorum tubis cylindricis ca. 6 mm. longis extus prope os puberulis intus tomentosis 5-lobatis diam. basi 1.3 lobis sinistrorsum contortis inter se obtectentibus oblique lineari-lanceolatis 6 mm. longis prope basem minute tomentosis demum patulis staminibus 5 prope tubi corollae medium affixis filamentis ca. 0.5 mm. longis glabris antheris 1.2 mm. longis brevissime apiculatis basi obtusis ovarii ovoideis ca. 1 mm. longis glabris stylis ca. 2 mm. longis stigmatibus conformibus folliculis subreniformibus verrucosis glabris apice rotundatis latere valde mucronulatis basi acuminatis 10–12 cm. longis 9–11 cm. latis seminibus suborbicularibus diam. ca. 6–8 cm. embryo submedio cotyledonibus fere oblongo-orbicularibus diam. ca. 2 cm.; pedunculo diam. 1 cm. verrucoso 1.4 cm. longo.

Type. In wet forest, Cacaluta, Acacoyagua, Chiapas, altitude 150 m., August 17, 1947, *Matuda 16978* (fruit) (*Matuda Herbarium*; isotypes at the Instituto de Biología de la Universidad Nacional de México and at the Chicago Natural History Museum).

Additional specimens. In wet forest, Finca Esperanza, 8 km. east of Escuintla, Chiapas, altitude 200 m., February 23, 1948, *Matuda 17538* (flower); *17634* (fruit).

Local name: "Chichi blanco."

In the region of the type locality, *Cufodontia escuintlensis* flowers in February and March, and the follicle is not fully mature until March of the following year. It has an altitudinal range of from 100 to 700 meters above sea level in the Pacific coast rain forest and is always found growing with *Aspidosperma chiapense* and its form. It has no use as timber but can be used for firewood. The natives, however, find a use for its bark, from which they make a very bitter decoction to cure malaria. The general aspect of the seed, with its papery concentric wing, is very similar to that of those of the species of *Aspidosperma*, and for this reason, our plant may be taken for a species of that genus, especially if only the follicles and not the flowers themselves are examined.

By inadvertence, two specimens (*Matuda 16978*, type of *Cufodontia escuintlensis*; 17538) were determined by Steyermark as *Aspidosperma cruentum* and so distributed.

Cufodontia escuintlensis seems rather close to *C. stegomeris* of Costa Rica, but it differs in its somewhat narrower, longer and larger leaves and in its larger floral organs. It is noteworthy that one of these specimens (16978) is the first collection ever made of a fruiting *Cufodontia*.

CUFODONTIA LUNDELLIANA Woodson, Archivio Bot. Sist. Fitogeog. & Genet. 10: 40. 1934. *Aspidosperma Lundellianum* Woodson, Bull. Torrey Club 4: 684. 1935.

Aspidosperma Lundellianum was described from fruiting material which had no flowers while the description of *Cufodontia Lundelliana* was based on flowering material devoid of fruits. I have examined a photograph of an isotype (*Lundell 1284*) of *Aspidosperma Lundellianum*, kindly forwarded through the courtesy of Dr. Rogers McVaugh, Curator of the Herbarium of the University of Michigan. Without any doubt, this is a fruiting specimen of *Cufodontia* and not of *Aspidosperma*.

When Lr. Woodson proposed the genus *Cufodontia* (Archivio Bot. Sist. Fitogeog. & Genet. 10: 39. 1934), he wrote, "It is hoped that additional, particularly fruiting, specimens of this genus will shortly be forthcoming." In point of fact, he actually had received, about a year previous, a representative fruiting specimen of *Cufodontia* (*Lundell 1284*), referred to above, to which he had applied the herbarium name of *Aspidosperma Lundellianum* with the date "Nov., 1933," though this binomial was not published until July, 1935. Woodson had thus described the same plant twice, each time in a different genus, basing his characters in one case on the flowers and in the other, on the fruits. The present writer has had the opportunity of collecting the flowers and fruits of *Cufodontia escuintlensis*, at different seasons to be sure, from the same tree. At the time of flowering, its fresh newly developed leaves are relatively thin while at the time the follicles are col-

lected, six months or more later (it takes one whole year after flowering for the fruit to ripen), the fully developed leaves are thick and leathery so that it seems as though they were not from the same plant species.

There are now four species of *Cufodontia*, all confined to southern Mexico and Central America. These may be distinguished as follows:

Outer calyx-tube 3.5–4 mm. or more long; pedicels 3–5 mm. long.

Leaves oblong-lanceolate (plant of Chiapas) 1. *C. escuintlensis*

Leaves elliptic (plant of Costa Rica) 2. *C. stegomeris*

Leaves oblong-elliptic, 12×4.5 cm., lateral nerves 15–18 (fide Woodson) 3. *C. arborea*

Outer calyx-tube never as long as 3.5 mm.; pedicels only 1 mm. long (plant of Yucatan region) 4. *C. Lundelliana*

From the same area, three species and one *forma* of *Aspidosperma* are known, which may be separated as follows:

Leaves 3–5×10–15 cm.; follicles 10–12 cm. long, essentially glabrous 1. *A. megalocarpon*

Leaves 2.3–3×6–8 cm.; follicles 8–10×14×16 cm., floccose-velutinous; latex red (fide Woodson) 2. *A. cruentum*

Leaves 4–5×15–18 cm.; follicles 10×16 cm. sericeous-velutinous.

Heartwood moderately tough, vivid or dull rose; latex of fresh follicle pale rose 3. *A. chiapense*

Heartwood yellow and very tough; cortex not thick nor scaly; latex white 4. *A. chiapense*
f. *tenax*

Specimens examined. *CUFODONTIA LUNDELLIANA*. Petén, Guatemala, *Lundell 3408* (photo, Chicago Nat. Hist. Museum); Tuxpena, Campeche, *Lundell 1284*, misidentified as *Aspidosperma Lundellianum* (photo, Herb. Univ. Michigan).

CUFODONTIA STEGOMERIS. Costa Rica, *Cufodontis 220* (photo, Chicago Nat. Hist. Museum).

ASPIDOSPERMA CHIAPENSE. Chiapas, *Matuda 18412, 18406, 16361* (flower) (Matuda Herb.).

ASPIDOSPERMA CHIAPENSE f. *TENAX*. Chiapas, *Matuda 17386, 18413* (Matuda Herb.).

CUFODONTIA ESCUINTLENSIS. Chiapas, *Matuda 16978* (fruit), *17538* (flower), *17634* (fruit) (Matuda Herb.).

Matuda Herbarium
Tacubaya, México, D.F.

EARLIER PAPERS BY THE AUTHOR TREATING THE FLORA OF CHIAPAS.

- I. On the genus *Mitrastemon*. Bull. Torrey Club 74: 133–141. 1947.
- II. A new *Dracontium* from southern Mexico. Am. Midland Nat. 41: 404–405. 1949.
- III. Some new *Araceae* from southern Mexico. Madroño 10: 47–51. 1949.
- IV. A new species of *Carludovica* from southern Mexico. Bull. Torrey Club 76: 210–212. 1949.
- V. A contribution to our knowledge of the wild flora of Mount Ovando. Am. Midland Nat. 43: 195–223. 1950.

A NEW VARIETY OF ENGELMANN SPRUCE

GEORGE J. GOODMAN

PICEA ENGELMANNI Parry ex Engelm. var. *glabra* var. nov.
Ramulis glabris.

Type. Near Nash's Fork, Medicine Bow Mountains, altitude 10,000 feet, Albany County, Wyoming, July 10, 1948, *Goodman 4904* (Bebb Herbarium, Univ. Oklahoma).

The location given is in the climax Engelmann spruce-alpine fir forest near the University of Wyoming Science Camp. Other specimens in the Bebb Herbarium collected in this locality are as follows: near the Camp, June 20, 1931, *Howard King*, June 27, 1935, *C. T. Eskew*; Mill Pond (about 2 miles west of the Camp) July 22, 1949, *Goodman 5114*.

This glabrous phase was first observed at the type locality, which is at a point along the very eastern limit of the range of *Picea Engelmanni*—the mountains soon dropping off to the eastward to the Great Plains. Near the Camp several score of trees were observed and it was noted that, regardless of habitat or size and age of tree, about one out of three trees had glabrous twigs.

Judging from the few observations made thus far, this high concentration of glabrous individuals is decidedly localized. On the Hayden Division of the Medicine Bow National Forest, about forty-five miles southwest across the Continental Divide, and in a range separated from the Medicine Bows by the sagebrush covered valley of the North Platte River, three brief samplings were made. At the first locality, there were twenty pubescent trees and two glabrous ones. At the second, fifteen pubescent and no glabrous ones, and at the third, twenty-seven pubescent and one glabrous—a sharp difference from the count of two pubescent to one glabrous on Nash's Fork.

The uniformity of the literature in referring to the pubescent twigs of Engelmann spruce attests to the wide prevalence of the character. Occasional reference may be found, however, to variations in, or lack of pubescence. Kearney and Peebles (1942, p. 64) state in their key, “. . . comonly pubescent or puberulent,” and the description of Engelmann spruce in Jepson (1925, p. 51) reads, “. . . branchlets (in ours) glabrous.” Whether the Shasta County, California, specimens are of the same variety as those from eastern Wyoming is unknown.

The trees with pubescent twigs are herewith designated as follows:

PICEA ENGELMANNI Parry ex Engelm. var. *typica* nom. nov.
P. Engelmanni Parry ex Engelm. Trans. Acad. Sci. St. Louis 2: 212. 1863.

The few cones measured are on the average shorter in the glabrous variety, but no other differences have been detected be-

tween the two varieties. The distribution of the resin ducts in the needles is primarily in the proximal half, as recorded by Marco (1931) and Freytag and Reed (1948) for Engelmann spruce.

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FRED WILLIAM FOXWORTHY

Fred William Foxworthy was born in Goodland, Indiana, July 3, 1877, the son of a Methodist clergyman. Largely by his own efforts, he was able to attend DePauw University, where he was graduated in 1899. After a season at Woods Hole, he entered Cornell University where he received his master's degree in entomology in 1902, and his doctorate in botany in 1904.

He was in the Philippine service from 1905 through 1916, the last three years as head of the School of Forestry and Chief of the Division of Forest Investigation in the Bureau of Forestry, and Professor of Dendrology in the University of the Philippines. In a group of men of distinction, he was particularly distinguished by devotion to the search for the truth (research), and as a teacher of students.

In 1917, he went to the Federated Malay States as Forest Research Officer, being the only non-British subject in the British Colonial Service. He remained there until retired for age in 1932.

He was always particularly interested in timbers, in their sources, characteristics and uses, and published many important works on these subjects. A book on the timber resources of the Orient, finished two years ago, is understood to be in press.

He was a zealous traveler. His journeys, which took him from Scotland to New Zealand, and which included Africa from the Cape to Cairo, enabled him to see in person what the World could contribute to his understanding. After his retirement, he visited Latin America.

In 1934, he married Laura Mae Williamson and settled in Berkeley where the status of a Research Associate in the Department of Botany gave him the facilities of the University of California. He was President of the California Botanical Society in 1942. His death came suddenly in Berkeley on February 4, 1950.

Because the operation of botanical nomenclatural rules tends to commemorate those who contribute to this field of botany, Dr. Foxworthy will be remembered longer for his work in systematic botany, chiefly in the Dipterocarpaceae, than for his more really and immediately important work on the sources, structure and uses of wood.

His friends, throughout the World, will cherish his memory as that of a perfect gentleman.—E. B. COPELAND, Department of Botany, University of California, Berkeley.

GENERIC NAMES OF ALGAE PROPOSED FOR CONSERVATION. II.

GEORGE F. PAPENFUSS¹

In a previous article in this journal, the writer (Papenfuss, 1947) drew attention to several well-established generic names of algae which appeared to be illegitimate and hence in need of conservation. Further work on the marine algae has brought to light a few additional names which might profitably be conserved. They are hereby proposed for conservation.

CHLOROPHYCOPHYTA

PERCURSARIA Bory (Ulvaceae), Dict. class. hist. nat. 4: 393. 1823; and 13: 206. 1828.

versus

Percursaria Bonnemaison, Jour. Phys., Chimie, Hist. Nat. et Arts 94: 178. 1822.

Tetranema Areschoug. Phyc. scand., sect. posterior 418, pl. 2, fig. A. 1850. (Not *Tetranema* Bentham, 1843.)

Diplonema Kjellman, Alg. Arctic Sea 302. 1883. (Not *Diplonema* G. Don, 1838, nor *Diplonema* De Notaris, 1846.)

Type species: *Percursaria percura* (Ag.) Bory (1828, p. 206).

Although *Percursaria* Bory is a monotypic genus, it has a wide distribution and has for a long time been known by this name. A few authors have regarded the genus as synonymous with *Enteromorpha* Link (1820) but the non-tubular thallus, with its two longitudinal rows of cells, clearly distinguishes *Percursaria* from *Enteromorpha*. The illegitimatizing homonym *Percursaria* Bonnemaison, which is based on *Scytonema compactum*, is synonymous with the schizophycean genus *Dichothrix* Zanardini (1858).

¹The greater part of the work connected with the preparation of this article was done while the writer held a Guggenheim Fellowship.

RHODOPHYCOPHYTA

PRIONITIS J. Agardh (Grateloupiaceae), Sp. alg. 2(1): 185. 1851.

versus

Prionitis Adanson, Fam. pl. 2: 499. 1763.

Zarnardinula De Toni fil., Not. nomencl. alg. VII, p. [6]. 1936.

Type species: *Prionitis lanceolata* (Harvey) Harvey (1853; see also Schmitz 1889, p. 452 = *Prionitis ligulata* J. Agardh, 1851).

As has been pointed out by J. De Toni (1936), the generic name *Prionitis* J. Agardh (1851) is a later homonym of *Prionitis* Adanson (1763), a genus of flowering plants. J. De Toni accordingly gave the name *Zarnardinula* to the genus of algae and this epithet was subsequently adopted by Papenfuss (1944), Dawson (1945, 1946) and Doty (1947). Inasmuch as the name *Falcaria* Host (1827) has been conserved against *Prionitis* Adanson and since *Prionitis* J. Agardh has been the accepted name of a genus of algae for almost a century, it is suggested that this name be considered for conservation.

BINDERA Harvey (Rhodymeniaceae), Phyc. austr. 2, pl. 111 and accompanying text. 1859.

versus

Bindera Rafinesque, New fl. Amer. 4: 71. 1836 [1838].

Bindera J. Agardh, Linnaea 15: 36. 1841.

Webervanbossea De Toni fil., Not. nomencl. alg. VII, p. [5]. 1936.

Type species: *Bindera splachnoides* Harvey, op. cit., pl. 111, figs. 1-2 (cf. Kylin, 1931, p. 5).

In 1936 J. De Toni proposed the name *Webervanbossea* as a substitute for *Bindera* Harvey (1859) because the latter epithet was illegitimatized by both *Bindera* Rafinesque (1838), a genus of flowering plants, and *Bindera* J. Agardh (1841), a genus of red algae. Since *Bindera* Rafinesque is a synonym of *Aster* Linnaeus (1753) and *Bindera* J. Agardh a synonym of *Spyridia* Harvey (in Hooker, 1833), there is no obstacle to the retention of *Bindera* Harvey if the name were legitimized through conservation.

Although *Bindera* at present includes only three species (*B. splachnoides* Harvey, *B. kaliformis* J. Agardh and *B. Levringii* Lindauer ined.), the genus is of considerable morphological interest. Moreover, it commemorates the name of a man who did much for the furtherance of our knowledge of algae, and of whom Harvey (*loc. cit.*) wrote: ". . . I gladly take this opportunity of paying an old debt, by inscribing it with the name of Dr. [Nicholas] Binder, of Hamburg, an enthusiastic admirer of Algae, the possessor of a noble collection [elsewhere referred to by Harvey as 'one of the finest collections of Algae in Europe'], which he freely opens for the use of all interested in this branch of botany, and to whom I am personally under obligation for repeated contributions of valuable specimens."

CHAUVINIA Harvey (Delesseriaceae), Phyc. austr. 4, pl. 240 and accompanying text. 1862.

versus

Chauvinia Bory, Cryptogamia, in L. I. Duperrey, Voyage autour du monde, . . . , la Coquille, . . . , 2 (1): p. 204. 1829.

Vinassaella De Toni fil., Not. nomencl. alg. VII, p. [5], 1936.

Type species: *Chauvinia coriifolia* (Harv.) Harv. (cf. Kylin, 1924, pp. 12-13).

When Harvey described his genus *Chauvinia* in 1862, he credited it with three species, viz., *C. imbricata* (Aresch.) Harv. (= *Delesseria imbricata* Areschoug), *C. Hookeri* (Lyll) Harv. (= *Delesseria Hookeri* Lyll) and *C. coriifolia* (Harv.) Harv. (= *Delesseria coriifolia* Harvey). In the course of time, *Chauvinia imbricata* was removed by J. Agardh (1898, p. 174) to his newly established genus *Phytomophora*, where it serves as the lectotype of the genus (cf. Kylin, 1924, p. 13) and *C. Hookeri* was made by Kylin (1929) the type of a new (and at that time monotypic) genus, *Laingia*. Through the principle of residue, *Chauvinia coriifolia* thus came to serve as the type of *Chauvinia*, despite the fact that Schmitz in 1889 had designated *C. imbricata* as the lectotype of the genus.

Although J. Agardh (1898, p. 148) and Kylin (1924) seem to have overlooked the fact that Schmitz had designated *Chauvinia imbricata* as the lectotype of *Chauvinia*, there is considerable justification for their selection of *C. coriifolia* as the type of this genus. *Chauvinia* was, to be sure, established by Harvey in connection with his account of *C. imbricata* in 1862, but he had already, in 1860, in connection with his account of *Delesseria coriifolia*, come to realize the desirability of creating a separate genus for this species and *D. Hookeri*. To avoid the substitution of a new name for *Phytomophora*, it thus seems best to follow J. Agardh and Kylin in their choice of *Chauvinia coriifolia* as the type of *Chauvinia*. When J. De Toni (1936) substituted the name *Vinassaella* for *Chauvinia*, he also accepted *C. coriifolia* as the type of the genus.

Inasmuch as *Chauvinia* Bory (1829) is synonymous with *Caulerpa* Lamouroux (1809), there appears to be no obstacle to the continued use of *Chauvinia* Harvey and it is proposed that this name be considered for conservation. In addition to *C. coriifolia*, *Chauvinia* at present includes a species recently described by Børgesen (1945) under the name *C. Jadinii*.

POLYNEURA Kylin (Delesseriaceae), Delesseriaceen 33. 1924.
versus

Polyneura J. Agardh, Anal. alg., contin. 5: 58-60. 1899.

Type species: *Polyneura Hilliae* (Grev.) Kylin (*loc. cit.*).

The genus *Polyneura* Kylin (1924) has received general recognition, and it would be advantageous to conserve this name against the earlier homonym of *Polyneura* J. Agardh (1899).

This monotypic genus of J. Agardh was established on a species, *P. californica* J. Agardh, which Setchell and Gardner (1903, p. 304) have found to be representative of *Erythrophyllum* J. Agardh (1872), viz., *E. delesserioides* J. Agardh. The existence of the name *Polyneura* J. Agardh was brought to my attention by Mr. David Erskine of the University of California and I thank him for kindly agreeing to the inclusion of *Polyneura* Kylin in the present list of names proposed for conservation.

MARTENSIA Hering (Delesseriaceae), Ann. and Mag. Nat. Hist. 8(49): 92. 1841.

versus

Martensia Giseke, Prael. 207, 227, 249. 1792.

Hemitrema R. Brown, in S. L. Endlicher, Mant. bot. sistens gen. pl., suppl. 3: 50. 1843.

Mesotrema J. Agardh, Öfvers. K. Sv. Vetensk.-Akad. Förhandl. 11: 110. 1854.

Capraella De Toni fil., Not. nomencl. alg. VII, p. [3]. 1936.

Type species: *Martensia elegans* Hering.

J. De Toni in 1936 drew attention to the fact that the algal genus *Martensia* Hering (1841) was illegitimatized by *Martensia* Giseke (1792), a genus of flowering plants, and he accordingly proposed the name *Capraella* for the genus of algae. Papenfuss (1942) pointed out, however, that the name *Mesotrema* J. Agardh (1854) was available for the genus of algae. *Hemitrema* R. Brown (1843) is illegitimate since it is based on isotype material of the type species of *Martensia* Hering, *M. elegans*, and was nomenclaturally superfluous when published [Int. Rules Bot. Nomencl., Sec. 12, Art. 60(1)].

In view of the fact that *Martensia* Giseke is a synonym of *Alpinia* Linnaeus (1753) and since *Martensia* Hering, named in honor of Dr. Georg Matthias von Martens, the author of "Die Tange der preussische Expedition nach Ost-Asien", has for more than a century been the accepted name for a very remarkable genus of reticulate algae (of some eight species), which has become well known through the monographic account of Svedelius (1908), it is proposed that *Martensia* Hering be considered for conservation.

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A CHANGE IN STATUS OF A MALVASTRUM FROM BAJA CALIFORNIA, MEXICO

IRA L. WIGGINS

In September, 1929, the late John W. Gillespie and I collected an attractive species of *Malvastrum* a few miles north of Ensenada, Baja California, Mexico. It was strikingly different from any representative of the genus growing in San Diego County, California, less than one hundred miles to the north. When we returned to Stanford University a description was written, a plate made to illustrate the "new species" and then, fortunately, the description and drawing were laid aside until a thorough check of types in eastern herbaria could be made. The scope of the research problem begun in 1929 had to be changed, and the *Malvastrum*, growing outside the confines of the Sonoran Desert, was not compared with types until recently. Dr. Reed C. Rollins has kindly permitted me to borrow the type of Asa Gray's *Malvastrum marrubioides* var. *paniculatum*. The plant collected in 1929 belongs to the same entity, but for reasons that will be discussed below it seems advisable to elevate the "variety" to specific rank. Accordingly the following new combination is proposed.

Malvastrum paniculatum (Gray) comb. nov. *Malvastrum marrubioides* var. *paniculatum* Gray, *Proc. Am. Acad.* 22: 290. 1887.

An erect or ascending openly branched shrub 1-2.5 m. tall, with stoutish, densely stellate-tomentose branches, the tomentum pale tawny to brownish; petioles 4-10 (or rarely to -15) mm. long, densely tomentose and somewhat scurfy; leaf-blades ovate to pentagonal-ovate, obscurely to distinctly 3-lobed, 1.5-4 cm. broad, 2-5 cm. long, or those on vigorous young shoots 8-10 cm.

long, irregularly and rather coarsely dentate, prominently veined beneath, slightly rugose with impressed veins on the upper surface, densely stellate-tomentose with grayish to tawny hairs on both surfaces, the lateral lobes usually rounded, the terminal one acute to rounded, the teeth broadly deltoid and rounded or coarser and acute; inflorescence paniculate, rather open, often 3–5 dm. long; peduncles and pedicels slender, about 0.3–0.5 mm. in diameter, to 6 cm. long, at first densely stellate-tomentose, but eventually scurfy and subglabrate; bracts 1–3, filiform-subulate, 3–4 mm. long; calyx-cup broadly turbinate-campanulate, 3–4 mm. deep and about as wide at anthesis, densely tomentose; calyx-lobes broadly cordate-ovate, abruptly attenuate, 6–8 mm. wide, 6–15 mm. long, distinctly veined, stellate-tomentose without, silky-villous within; corollas pale pink to deep rose, the petals 10–15 mm. long, narrowly obovate and more or less emarginate or rounded at the apex, cuneately narrowed to the base, the claws hispidulous at the base; staminal column about two-thirds as long as the petals, nearly glabrous; fruit depressed-globose, 3–4 mm. high, 5–6 mm. broad, the carpels obovoid-reniform, rounded and densely stellate-tomentulose dorsally, dehiscing the full length; seeds 1.5–1.8 mm. long, dark brown, minutely and irregularly puberulent in broken patches, sparsely and minutely papillate between the puberulent patches.

Specimens examined. Baja California, Mexico: Ensenada de Todos Santos, July 14, 1885, C. R. Orcutt (type, Gray Herb.); on banks of small ravine, 6 miles north of Ensenada, Wiggins and Gillespie 4013; slopes of a small canyon 5 miles west of Ojos Negros, Wiggins and Gillespie 4079; arid ridge 20 miles east of Ensenada on road to Ojos Negros, Wiggins 11,869.

The type of *Malvastrum marrubioides* var. *paniculatum* is an ample specimen consisting of flowering and fruiting branches about 5 dm. long, twice folded to fit on the herbarium sheet. It had originally been labeled "*Malvastrum foliosum*, Watson" but in Gray's characteristic handwriting is the annotation, "*Malvastrum marrubioides* var. *paniculatum* n. var."

When Gray published var. *paniculatum* he did so in a footnote to a paper dealing with a number of genera being worked on in connection with the preparation of his "Synoptical Flora of North America." He furnished a very brief characterization that read "having copious and loosely paniculate flowers, some of them rather slender-pedicelled."

Gray's examination of Orcutt's specimen may have been hurried, or he may have remembered incompletely the characters of *M. marrubioides* Durand & Hilgard, for the plant from Ensenada bears only a superficial resemblance to *M. marrubioides*. The latter, the type of which I have examined critically, has ovate to suborbicular leaves with serrate-dentate margins, the teeth being sharply acute and often twice as long as broad; bractlets beneath



PLATE 12. *MALVASTRUM PANICULATUM*. FIGS. A-B, habit of flowering branches, $\times 1$. FIG. C, seed, $\times 19$. FIG. D, leaves, $\times 1$. (Drawing by Mrs. Carl Janish.)

the calyces 8–18 mm. long and often equalling the calyx-lobes; calyx-lobes merely lance-ovate and not cordate. The carpels of *M. marrubioides* are closely invested with erect hairs on the upper surface, while those on the carpels of *M. paniculatum* are appressed and nearly parallel to the surface. In view of these differences between the two plants it seems that specific rank should be accorded the population to which Gray gave only varietal recognition. None of the material from the United States has pedicels as slender as those possessed by *M. paniculatum* and none of the material of *M. marrubioides* from the interior foothills of southern California and from the eastern side of the San Joaquin Valley exhibits the abruptly flaring, cordate calyx-lobes developed in *M. paniculatum* and shown in the accompanying figure.

In the same paragraph in which Gray proposed var. *paniculatum* he relegated *M. foliosum* S. Wats. (Proc. Am. Acad. 20: 356. 1885) to the synonymy of *M. marrubioides* Dur. & Hilg. An examination of the type of *M. foliosum* S. Wats., shows that it has the leaf-pattern of *M. densiflorum* S. Wats., rather than that of *M. marrubioides*. *Malvastrum foliosum* may be a race of *M. densiflorum*, but certainly it is not conspecific with *M. marrubioides*. On the basis of the material examined to date, I prefer to recognize both *M. paniculatum* and *M. foliosum* as distinct species.

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A NEW SPECIES AND SUBGENUS OF ATRIPLEX FROM SOUTHWESTERN COLORADO

WILLIAM A. WEBER

The genus *Atriplex* in the Chenopodiaceae is characterized, in part, by the presence of a pair of bract-like organs which enclose more or less permanently a single carpellate flower. The carpellate flower, moreover, lacks a perianth except in a very few species. These species fall into two groups, (1) the Eurasian section *Hortenses* in which some of the carpellate flowers are ebracteolate and are provided with a regular 3–5-lobed herbaceous calyx, and (2) the North American section *Endolepis* in which the carpellate flowers are provided with a calyx of hyaline scales.

Hall and Clements (The phylogenetic method in taxonomy. The North American species of *Artemisia*, *Chrysothamnus*, and *Atriplex*. Carnegie Inst. of Wash. Publ. No. 326. 1923) divided the North American species of *Atriplex* into the two subgenera *Euatriples* and *Obione*, and postulated the characters which might be combined in a primitive stock from which the subgenera were derived. This primitive stock, according to Hall, would have an inferior radicle, and would have a perianth present both in staminate and pistillate flowers. The present paper records the dis-

covery of a species of *Atriplex* which embodies these and other primitive characters.

The proposed new species was collected in the spring of 1949 on a botanical survey of the "Four Corners" area of southwestern Colorado which was sponsored by the University of Colorado Council on Research and Creative Work. This area is one that is noteworthy for the extreme localization of the species inhabiting it. The season was an especially good one for the collection of ephemeral desert annuals. One small colony of a few hundred individuals of the new species was found on an extremely barren gray clay mesa slope uninhabited by any other species except *Phacelia demissa* A. Gray. The two species grew in adjacent stands and were superficially very similar in habit, stature, and foliage characters.

In addition to the two characteristics stated above, the proposed species possesses the following attributes which Hall asserted to be primitive or generalized in *Atriplex*; bracts soft, herbaceous, widest below the middle, free to the base or nearly so; plants monoecious, with flowers of each sex mixed together in small axillary clusters; herbaceous habit. The new species also possesses a primitive feature of considerable phylogenetic importance which Hall did not anticipate, namely, the inclusion of several carpellate flowers (i.e., an entire branch of an inflorescence) within a pair of bracts. Occasional pairs of bracts were found to surround from one to two pairs of similar but smaller bracts, each in turn enclosing from two to four carpellate flowers. This evidence supports the viewpoint that the bracteal structure of the carpellate flowers of *Atriplex* represents a greatly modified and reduced inflorescence in which the bract-pairs are homologous to the floral bracts of a complex dichasium. The shape and the absence of fusion of the bracts, the inferior position of the radicle, and the annual habit suggest a close relationship with the section *Hortenses*. The nature of the carpellate perianth suggests some relationship to the section *Endolepis*, the members of which, however, differ from the new species in certain fundamental respects, such as the superior radicle and united bracts. In the author's opinion, the combination of characters exhibited by the new species is unique and necessitates (1) an expansion of the definition of the genus *Atriplex* to include the several-flowered carpellate bract-pairs, and (2) the recognition of a third subgenus for Hall's primitive stock, exemplified by the present species. This subgenus is here proposed.

Subgenus *Proatriplex* W. A. Weber, subgen. nov. Radicula inferior. Perianthium et in floribus staminatis et in carpellatis adest. Bracteae usque ad basin liberae plerosque flores carpellatos includentes.

Radicle inferior. Perianth present in both staminate and carpellate flowers. Bracts free to the base, enclosing several carpellate flowers.



FIG. 1. *Atriplex pleiantha* Weber, type specimen.

Atriplex pleiantha sp. nov. Herba annua monoica erecta glabra vel rare farinosa paene ex basi ramosissima 0.5–1.5 dm. alta caule foliisque subsucculentis; rami ascendentes albi vel plerumque subrufi; folia plura alterna integra succulenta petiolis 0.5–1.0 cm. longis laminis ovatis vel suborbicularibus 5–15 mm. longis apice obtusissimis et per gradus in contraria acutis basi eodem modo cuneatis vel truncatis; flores staminati et carpellati in inflorescentia immixti aut flores staminati in spicas breves terminales moniliformes collecti; stamina florum staminatorum 5, segmentis perianthii opposita affixa; bracteae florum carpellatorum trianguli-ovatae brevi-petiolatae integrae 3–7 mm. latae et longae apice obtusae vel mucronatae ad basin ipsam tantum conjunctae, margine superiore cilia inflexa aliquot ferente, binis bracteis quibusque 2–6 flores carpellatos includentibus demum cupulam fingentibus; perianthium florum carpellatorum manifestum squamis 5 hyalinis lanceolatis vel oblanceolatis rare ciliato-marginatis in cupula permanentibus 1.0–1.2 mm. longis consistens; utriculus suborbicularis compressus ater glaber et fulgens 1.5 mm. longus, maturatus discedens, non in perpetuum in bracteis inclusus; semen verticale; radícula inferior.

Erect annual herb, much branched from near the base, glabrous or sparsely farinose, 0.5–1.5 dm. tall with rather fleshy stem and foliage; branches ascending, white or commonly reddish; leaves numerous, alternate, entire, fleshy, the petioles 0.5–1.0 cm. long, the blades ovate or suborbicular, 5–15 mm. long, very obtuse to acute at the apex, cuneate to truncate at the base; flowers monoecious, the staminate and carpellate mixed in the inflorescence or the staminate grouped into short terminal moniliform

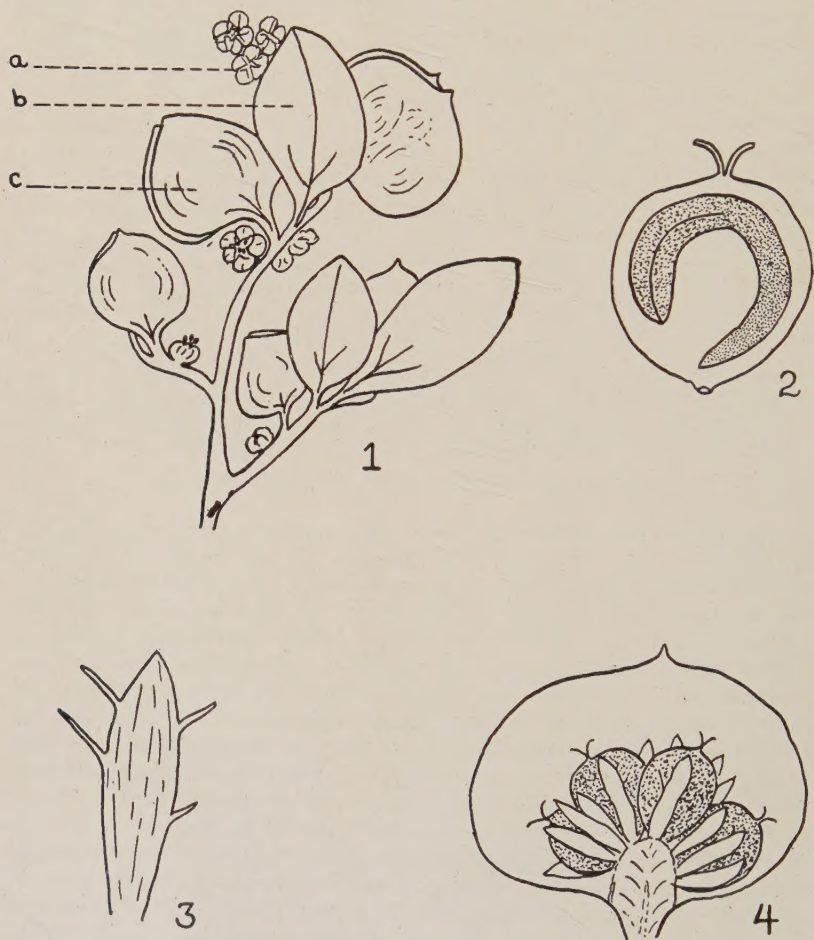


FIG. 2. *Atriplex pleiantha* Weber, 1, portion of plant ($\times 5$), showing a. staminate flower, b. leaf, c. bract of carpellate flower cluster; 2, gynoecium showing position of embryo ($\times 15$); 3, perianth segment of carpellate flower ($\times 30$); 4, diagrammatic representation of ventral view of bract showing enclosed cluster of carpellate flowers ($\times 6$).

spikes; stamens of staminate flowers 5, opposite the perianth segments; bracts of carpellate flowers triangular-ovate, short-petiolate, entire, 3-7 mm. broad and long, obtuse or mucronate at apex, united only at the very base, usually bearing a few inflexed cilia on the upper margin, each pair of bracts enclosing from 2 to 6 carpellate flowers; perianth of carpellate flowers well-developed, consisting of 5 hyaline, lanceolate or oblanceolate, sparsely ciliate-margined scales, 1.0-1.2 mm. long, persistent in the cupule formed by the bracts; utricle suborbicular, compressed, black, smooth and shining, 1.5 mm. long, falling free at maturity, not permanently enclosed within the bracts; seed vertical; radicle inferior.

COLORADO. Montezuma County: barren clay slope of mesa, northeast of trading post on Mancos River a few miles above its junction with the San Juan River, ca. 27 mi. southwest of Towaoc, Ute Indian Reservation (Township 32 N., Range 19 W., Section 17), June 12, 1949, *W. A. Weber 4788* (type, Univ. of Colorado Herb.; isotypes, Gray Herb., Pomona College Herb., U. S. Nat. Herb., Univ. of California Herb.).

The writer wishes to express his appreciation to Dr. John Hough for preparation of the Latin diagnoses.

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REVIEW

Marin Flora, Manual of the Flowering Plants and Ferns of Marin County, California. By JOHN THOMAS HOWELL. University of California Press, Berkeley and Los Angeles, California. vii + 1-323 pp., frontispiece, plates 1-24, maps 2. 1949. \$4.50.

Among the symptoms of approaching maturity of the science of Botany in California are the number of semi-popular and popular local floras that are beginning to appear for various regions of the state. The latest is "Marin Flora" by John Thomas Howell of the California Academy of Sciences. Such works serve a very useful purpose for the professional botanist as well as for the layman and naturalist. They become a detailed historical record of the composition and condition of a flora which through the activities of man is destined to become irrevocably altered with time.

The first twenty-eight pages deal with a discussion of descriptive ecology and plant geography as these appear to relate themselves to the physical features of the area. The lists of plants comprising the various plant associations should prove very useful to ecologists in both the plant and animal fields. It is not to be expected that all ecologists and plant geographers will agree with Mr. Howell's conclusions. It must be borne in mind that in so far as we are able to deal with such problems today, we must rely

largely upon interpretation of the innumerable and varied inter-related facts for our conclusions in ecology and plant geography. This being the case, it is important that as many points of view be presented as possible. Mr. Howell presents the point of view of one intimately acquainted with the detailed occurrence of the known species of plants over the area, and of one who has contemplated the details of their local variation. There follow four pages containing a brief resume of the botanical history of the area and including a fitting tribute to the place of Miss Alice Eastwood and the California Academy of Sciences in this history.

The taxonomic section, which represents the bulk of the work, is a scholarly treatment replete with critical notes on variation, ecology, and nomenclature. It is obvious that Mr. Howell's taxonomic conclusions are his own conclusions and not compiled from the taxonomic treatments of others. However, where his conclusions deviate considerably from those of others, they are accompanied by a compelling argument or an explanatory statement. Of the 1,313 species included in the flora, 309 are non-native introduced plants which have become established in this area. In Jepson's "Manual of the Flowering Plants of California" published in 1925, there are included 4,019 species for the entire state, of which 292 are considered to be "alien immigrants." The large proportionate number of introduced plants reported for Marin County reflects Mr. Howell's keen interest in this aspect of botany as well as the changes which have taken place in the flora during the past twenty-five years. The two works, "Marin Flora" and "Ferns and Flowering Plants of Mount Diablo," by Dr. Mary Bowerman, taken together, cover much of the flora of coastal central California. We who habituate this area are indeed fortunate in having two such excellent treatments of its flora.

The twenty-five black and white photographs from the camera of Charles H. Townsend portray the beauty and variety of plant associations and specimen trees that are to be found in Marin County. Two outline maps prepared by Malcolm G. Smith give general localities in Marin County and the trails and localities on Mount Tamalpais. Both maps are indexed; so the newcomer to Marin County will have no difficulty in orienting himself. Much of the glossary of some 380 terms is expressed in refreshingly original language.

As the flora of Marin County is presented by Mr. Howell, it must be construed as a semi-popular work in what I would say is a most successful style. He injects just enough personality to make it very readable. Obviously, when dealing with technical material, it is impossible to reduce all of it to popular language. Mr. Howell, however, draws a very dignified balance between the technical material and popular presentation.—HERBERT L. MASON, Department of Botany, University of California, Berkeley.